

# Broadcast and Sound Engineering Technicians and Radio Operators

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## Significant Points

- Job applicants face strong competition for jobs in major metropolitan areas, where pay generally is higher; prospects are better in small cities and towns.
- Technical school, community college, or college training in electronics, computer networking, or broadcast technology provides the best preparation.
- About 32 percent work in broadcasting, mainly for radio and television stations, and 16 percent work in the motion picture and sound recording industries.
- Evening, weekend, and holiday work is common.

## Nature of the Work

Broadcast and sound engineering technicians and radio operators set up, operate, and maintain a wide variety of electrical and electronic equipment involved in almost any radio or television broadcast, concert, play, musical recording, television show, or movie. With such a range of work, there are many specialized occupations within the field.

Audio and video equipment technicians set up and operate audio and video equipment, including microphones, sound speakers, video screens, projectors, video monitors, recording equipment, connecting wires and cables, sound and mixing boards, and related electronic equipment for concerts, sports events, meetings and conventions, presentations, and news conferences. They may also set up and operate associated spotlights and other custom lighting systems.

Broadcast technicians set up, operate, and maintain equipment that regulates the signal strength, clarity, and range of sounds and colors of radio or television broadcasts. They also operate control panels to select the source of the material. Technicians may switch from one camera or studio to another, from film to live programming, or from network to local programming.

Sound engineering technicians operate machines and equipment to record, synchronize, mix, or reproduce music, voices, or sound effects in recording studios, sporting arenas, theater productions, or movie and video productions.

Radio operators mainly receive and transmit communications using a variety of tools. They also are responsible for repairing equipment, using such devices as electronic testing equipment, handtools, and power tools. One of their major duties is to help to maintain communication systems in good condition.

Broadcast and sound engineering technicians and radio operators perform a variety of duties in small stations. In large stations and at the networks, technicians are more specialized, although job assignments may change from day to day. The terms “operator,” “engineer,” and “technician” often are used interchangeably to describe these jobs. Workers in these positions may monitor and log outgoing signals and operate transmitters; set up, adjust, service, and repair electronic broadcasting equipment; and regulate fidelity, brightness, contrast, volume, and sound quality of television broadcasts.

Technicians also work in program production. *Recording engineers* operate and maintain video and sound recording equipment. They may operate equipment designed to produce special effects, such as the illusions of a bolt of lightning or a police siren. *Sound mixers* or *rerecording mixers* produce the soundtrack of a movie or television program. After filming or recording is complete, they may use a process called “dubbing” to insert sounds. *Field technicians* set up and operate portable transmission equipment outside the studio. Television news coverage requires so much electronic equipment, and the technology is changing so rapidly, that many stations assign technicians exclusively to news.

Chief engineers, *transmission engineers*, and *broadcast field supervisors* oversee other technicians and maintain broadcasting equipment.

The transition to digital recording, editing, and broadcasting has greatly changed the work of broadcast and sound engineering technicians and radio operators. Software on desktop computers has replaced specialized electronic equipment in many recording and editing functions. Most radio and television stations have replaced video and audio tapes with computer hard drives and other computer data storage systems. Computer networks linked to the specialized equipment dominate modern broadcasting. This transition has forced technicians to learn computer networking and software skills. (See the statement on computer support specialists and systems administrators elsewhere in the *Handbook*.)

## Working Conditions

Broadcast and sound engineering technicians and radio operators generally work indoors in pleasant surroundings. However, those who broadcast news and other programs from locations outside the studio may work outdoors in all types of weather. Technicians doing maintenance may climb poles or antenna towers, while those setting up equipment do heavy lifting.

Technicians at large stations and the networks usually work a 40-hour week under great pressure to meet broadcast deadlines, and may occasionally work overtime. Technicians at small stations routinely work more than 40 hours a week.



Audio and video equipment technicians monitor and adjust sound and mixing boards.

Evening, weekend, and holiday work is usual, because most stations are on the air 18 to 24 hours a day, 7 days a week. Even though a technician may not be on duty when the station is broadcasting, some technicians may be on call during nonwork hours; that is, they must handle any problems that occur when they are on call.

Those who work on motion pictures may be on a tight schedule and may work long hours to meet contractual deadlines.

**Employment**

Broadcast and sound engineering technicians and radio operators held about 93,000 jobs in 2002. Their employment was distributed among the following detailed occupations:

Audio and video equipment technicians .....	42,000
Broadcast technicians .....	5,000
Sound engineering technicians .....	13,000
Radio operators .....	3,000

About 32 percent worked in broadcasting (except Internet) and 16 percent worked in the motion picture and sound recording industries. Almost 1 in 10 were self-employed. Television stations employ, on average, many more technicians than do radio stations. Some technicians are employed in other industries, producing employee communications, sales, and training programs. Technician jobs in television are located in virtually all cities, whereas jobs in radio also are found in many small towns. The highest paying and most specialized jobs are concentrated in New York City, Los Angeles, Chicago, and Washington, DC—the originating centers for most network or news programs. Motion picture production jobs are concentrated in Los Angeles and New York City.

**Training, Other Qualifications, and Advancement**

The best way to prepare for a broadcast and sound engineering technician job is to obtain technical school, community college, or college training in electronics, computer networking, or broadcast technology. In the motion picture industry, people are hired as apprentice editorial assistants and work their way up to more skilled jobs. Employers in the motion picture industry usually hire experienced freelance technicians on a picture-by-picture basis. Reputation and determination are important in getting jobs.

Beginners learn skills on the job from experienced technicians and supervisors. They often begin their careers in small stations and, once experienced, move on to larger ones. Large stations usually hire only technicians with experience. Many employers pay tuition and expenses for courses or seminars to help technicians keep abreast of developments in the field.

Audio and video equipment technicians generally need a high school diploma. Many recent entrants have a community college degree or various other forms of postsecondary degrees, although that is not always a requirement. They may substitute on-the-job training for formal education requirements. Working in a studio, as an assistant, is a great way of gaining experience and knowledge.

Radio operators do not usually require any formal training. This is an entry-level position that generally requires on-the-job training.

The Federal Communications Commission no longer requires the licensing of broadcast technicians, as the Telecommunications Act of 1996 eliminated this licensing requirement. Certification by the Society of Broadcast Engineers is a mark of competence and experience. The certificate is issued to experienced technicians who pass an examination.

Prospective technicians should take high school courses in math, physics, and electronics. Building electronic equipment from hobby kits and operating a “ham,” or amateur, radio are good experience, as is work in college radio and television stations.

Broadcast and sound engineering technicians and radio operators must have manual dexterity and an aptitude for working with electrical, electronic, and mechanical systems and equipment.

Experienced technicians can become supervisory technicians or chief engineers. A college degree in engineering is needed in order to become chief engineer at a large television station.

**Job Outlook**

People seeking entry-level jobs as technicians in broadcasting are expected to face strong competition in major metropolitan areas, where pay generally is higher and the number of qualified jobseekers typically exceeds the number of openings. There, stations seek highly experienced personnel. Prospects for entry-level positions usually are better in small cities and towns for beginners with appropriate training.

Overall employment of broadcast and sound engineering technicians and radio operators is expected to about as fast as the average for all occupations through the year 2012. Job growth in radio and television broadcasting will be limited by consolidation of ownership of radio and television stations, and by laborsaving technical advances such as computer-controlled programming and remotely controlled transmitters. Changes to Federal Communications Commission (FCC) regulations now allow a single owner for up to eight radio stations in a single large market, and rules changes under consideration may have a similar impact on the ownership of television stations. Owners of multiple stations often consolidate the stations into a single location, reducing employment because one or a few technicians can provide support to multiple stations. Technicians who know how to install transmitters will be in demand as television stations install digital transmitters. Although most television stations are broadcasting in both analog and digital formats and plan to switch entirely to digital, radio stations are only beginning to broadcast digital signals.

Employment of broadcast and sound engineering technicians in the cable and pay television portion of the broadcasting industry should grow as the range of services is expanded to provide, such products as cable Internet access and video-on-demand. Employment of these workers in the motion picture industry will grow rapidly. However, job prospects are expected to remain competitive because of the large number of people who are attracted by the glamour of working in motion pictures.

Projected job growth varies among detailed occupations in this field. Employment of broadcast technicians is expected to grow about as fast as the average for all occupations through 2012, as advancements in technology enhance the capabilities of technicians to produce higher quality radio and television programming. Employment of radio operators is expected to

decline as more stations operate transmitters that control programming remotely. Employment of audio and video equipment technicians and sound engineering technicians is expected to grow faster than the average for all occupations. Not only will these workers have to set up audio and video equipment, but it will be necessary for them to maintain and repair this equipment.

In addition to employment growth, job openings also will result from the need to replace experienced technicians who leave this field. Some of these workers leave for other jobs that require knowledge of electronics, such as computer repairer or industrial machinery repairer.

### **Earnings**

Television stations usually pay higher salaries than do radio stations; commercial broadcasting usually pays more than public broadcasting; and stations in large markets pay more than those in small markets.

Median annual earnings of broadcast technicians in 2002 were \$27,760. The middle 50 percent earned between \$18,860 and \$45,200. The lowest 10 percent earned less than \$14,600, and the highest 10 percent earned more than \$65,970.

Median annual earnings of sound engineering technicians in 2002 were \$36,970. The middle 50 percent earned between \$24,330 and \$57,350. The lowest 10 percent earned less than \$18,540, and the highest 10 percent earned more than \$82,510.

Median annual earnings of audio and video equipment technicians in 2002 were \$31,110. The middle 50 percent earned between \$22,670 and \$43,950. The lowest 10 percent earned less than \$17,710, and the highest 10 percent earned more than \$61,420.

Median annual earnings of radio operators in 2002 were \$31,530. The middle 50 percent earned between \$24,000 and \$41,430. The lowest 10 percent earned less than \$17,380, and the highest 10 percent earned more than \$56,340.

### **Related Occupations**

Broadcast and sound engineering technicians and radio operators need the electronics training necessary to operate technical equipment, and they generally complete specialized postsecondary programs. Occupations with similar characteristics include engineering technicians, science technicians, and electrical and electronics installers and repairers. Broadcast and sound engineering technicians also may operate computer networks, as do computer support specialists and systems administrators. Broadcast technicians on some live radio and television programs are responsible for screening incoming calls, similar to the work of communications equipment operators.

### **Sources of Additional Information**

For career information and links to employment resources, contact:

► National Association of Broadcasters, 1771 N St. NW., Washington, DC 20036. Internet: <http://www.nab.org>

For information on certification, contact:

► Society of Broadcast Engineers, 9247 North Meridian St., Suite 305, Indianapolis, IN 46260. Internet: <http://www.sbe.org>